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United States Department of Agriculture,

OFFICE OF THE SECRETARY—Circular No. 39.

THE ADULTERATION AND MISBRANDING OF THE SEEDS OF RED CLOVER, KENTUCKY BLUEGRASS, ORCHARD GRASS, AND HAIRY VETCH.

During the calendar year 1911 seeds of red clover, orchard grass, Kentucky bluegrass, and hairy vetch were secured in the open market in accordance with the following paragraph in the act of Congress making appropriations for the Department of Agriculture:

Where such samples [seeds of grasses, clover, or alfalfa secured in the open market are found to be adulterated or misbranded, the results of the tests shall be published, together with the names of the persons by whom the seeds were offered for sale.

In carrying out the provisions of this act 1,548 samples of seed were secured and analyzed under the direction of Mr. E. Brown, Botanist in Charge of the Seed Laboratory, and publication is here made of the analyses of 250 samples found to be adulterated or misbranded, together with the names of the seedsmen by whom they were offered for sale.

RED CLOVER.

During the year 510 samples of red clover seed were secured, none of which were found to be adulterated or misbranded.

ORCHARD GRASS.

Of the 305 samples obtained as orchard grass seed, 28 were found to be adulterated with seed of meadow fescue, rye-grass, or other seeds.

TABLE I.—Results of tests of samples of seed obtained in the open market as orchard grass seed and found to be adulterated or misbranded.

| Seed offered for sale or sold as orchard grass by— | | Seed obtained by— | Seeds and inert matter found upon analysis of samples. | | | |
|--|-------------------------------------|---------------------|--|-----------------------------------|---------------|-----------------|
| Name of dealer. | Address | | Orchard grass seed. | Rye-grass and meadow fescue seed. | Other seeds. | Dirt and chaff. |
| Brown's Seed Store.... | 223 State Street, New Albany, Ind. | Mail (sample)... | Per ct. 52.24 | Per ct. 13.38 | Per ct. 13.38 | Per ct. 34.18 |
| Do..... | do. | Purchase (bulk).... | 48.75 | 16.02 | 5.99 | 33.23 |
| Cone, J. H. & W. E.... | 87 Asylum Street, Hartford, Conn. | Mail (sample).... | 65.22 | 21.84 | .59 | 12.35 |
| Do..... | do. | Purchase (bulk).... | 64.97 | 23.47 | .73 | 10.80 |
| Harnden Seed Co..... | 505 Walnut Street, Kansas City, Mo. | Mail (sample).... | 55.82 | 29.19 | .59 | 14.40 |
| Do..... | do. | Purchase (bulk).... | 2.17 | 92.15 | 1.73 | 3.95 |
| Do..... | do. | do..... | 32.99 | 54.79 | 1.59 | 10.63 |

¹ Chess, 9.09 per cent.

² Chess, 3.48 per cent. Smooth chess, 7.01 per cent.

of hairy vetch is not harvested with the seed of the cultivated forms of spring vetch.

TABLE III.—Results of tests of samples of seed obtained in the open market as hairy vetch seed and found to be adulterated or misbranded.

| Seed offered for sale or sold as hairy vetch by— | | Seed obtained by— | Analysis of samples. | |
|--|--|-------------------|----------------------|----------------|
| Name of dealer. | Address. | | Hairy vetch. | Other vetches. |
| | | | Per cent. | Per cent. |
| Adams Seed Co., T. Lee. | 417 Walnut Street, Kansas City, Mo. | Purchase (bulk) | 100.00 | |
| Archias Seed Store | 108 East Main Street, Sedalia, Mo. | do | 80.67 | 19.33 |
| Barber & Bro. | 2015 First Avenue, Birmingham, Ala. | Mail (sample) | 88.33 | 11.67 |
| Do | do | Purchase (bulk) | 90.00 | 10.00 |
| Barnard Co., W. W. | 108 West Kinzie Street, Chicago, Ill. | Mail (sample) | 63.67 | 36.33 |
| Do | do | Purchase (bulk) | 64.00 | 36.00 |
| Barrett Co., W. E. | 65 Canal Street, Providence, R. I. | do | 69.34 | 30.66 |
| Bash & Co., S. | Fort Wayne, Ind. | Mail (sample) | 83.00 | 17.00 |
| Do | do | Purchase (bulk) | 50.34 | 49.66 |
| Beckert, W. C. | 103 Federal Street, Pittsburgh, Pa. | Mail (sample) | 82.33 | 17.67 |
| Do | do | Purchase (bulk) | 84.34 | 15.66 |
| Bellis & Son, L. B. | Clinton, N. J. | Mail (sample) | 86.33 | 13.67 |
| Do | do | Purchase (bulk) | 79.00 | 21.00 |
| Bolgiano & Son, J. | Light, Pratt, and Ellicott Streets, Baltimore, Md. | do | 51.00 | 49.00 |
| Brown Seed Co., Alfred J. | Ottawa and Louis Streets, Grand Rapids, Mich. | Mail (sample) | 86.67 | 13.33 |
| Do | do | Purchase (bulk) | 87.34 | 12.66 |
| Brown's Seed Store | 223 State Street, New Albany, Ind. | Mail (sample) | 43.00 | 57.00 |
| Do | do | Purchase (bulk) | 51.00 | 49.00 |
| Buckbee, H. W. | Rockford, Ill. | Mail (sample) | 84.67 | 15.33 |
| Do | do | Purchase (bulk) | 89.00 | 11.00 |
| Buist Co., Robert. | 4 South Front Street, Philadelphia, Pa. | Mail (sample) | 93.00 | 7.00 |
| Do | do | Purchase (bulk) | 46.34 | 53.66 |
| Bushnell & Co., D. I. | 105 North Second Street, St. Louis, Mo. | Mail (sample) | 42.33 | 57.67 |
| Do | do | Purchase (bulk) | 46.67 | 53.33 |
| Cadwell & Jones | 1082 Main Street, Hartford, Conn. | Mail (sample) | 90.34 | 9.66 |
| Do | do | Purchase (bulk) | 87.00 | 13.00 |
| Cassel & Son, F. P. | Lansdale, Pa. | Mail (sample) | 92.34 | 7.66 |
| Do | do | Purchase (bulk) | 86.00 | 14.00 |
| Condon Bros. | Rockford, Ill. | do | 47.67 | 52.33 |
| Cover, U. J. | Mount Gilead, Ohio | do | 83.67 | 16.33 |
| Craig & Co., R. G. | 104 South Front Street, Memphis, Tenn. | Mail (sample) | 74.50 | 25.50 |
| Do | do | Purchase (bulk) | 79.34 | 20.66 |
| Currie Bros. | 312 Broadway, Milwaukee, Wis. | Mail (sample) | 84.53 | 15.47 |
| Do | do | Purchase (bulk) | 85.33 | 14.67 |
| Davis Co., Zack. | Delaware, Ohio | Mail (sample) | 34.67 | 65.33 |
| Do | do | Purchase (bulk) | 35.34 | 64.66 |
| Des Moines Seed Co. | 409 East Fifth Street, Des Moines, Iowa. | do | 77.67 | 22.33 |
| Dickinson Co., Albert. | West Taylor Street and River, Chicago, Ill. | Mail (sample) | 93.67 | 6.33 |
| Do | do | Purchase (bulk) | 81.67 | 18.33 |
| Diggs & Beadles | 1428 East Main Street, Richmond, Va. | do | 75.00 | 25.00 |
| Dunning & Co., R. B. | 54 Broad Street, Bangor, Me. | Mail (sample) | 90.33 | 9.67 |
| Do | do | Purchase (bulk) | 73.00 | 27.00 |
| Elliott & Sons, Wm. | 42 Vesey Street, New York, N. Y. | Mail (sample) | 86.80 | 13.20 |
| Do | do | Purchase (bulk) | 80.33 | 19.67 |
| Ewing Seed Co. | 309 Second Avenue, North, Nashville, Tenn. | do | 88.33 | 11.67 |
| Farquhar & Co., R. & J. | 6 South Market Street, Boston, Mass. | Mail (sample) | 79.33 | 20.67 |
| Do | do | Purchase (bulk) | 79.67 | 20.33 |
| Ferry & Co., D. M. | Detroit, Mich. | Mail (sample) | 91.67 | 8.33 |
| Do | do | Purchase (bulk) | 68.00 | 32.00 |
| Field Seed Co., Henry. | Shenandoah, Iowa. | Mail (sample) | 94.33 | 5.67 |
| Do | do | Purchase (bulk) | 86.33 | 13.67 |
| Forrest Seed Co. | Cortland, N. Y. | Mail (sample) | 89.33 | 10.67 |
| Do | do | Purchase (bulk) | 71.00 | 29.00 |
| Frost, David C. | 758 West Short Street, Lexington, Ky. | do | 43.33 | 56.67 |
| German Nurseries. | Beatrice, Nebr. | do | 67.00 | 33.00 |
| Godden Seed Co., Amzi. | Birmingham, Ala. | Mail (sample) | 56.33 | 43.67 |
| Do | do | Purchase (bulk) | 75.33 | 24.67 |
| Great Northern Seed Co. | Rockford, Ill. | Mail (sample) | 84.38 | 15.62 |
| Do | do | Purchase (bulk) | 80.34 | 19.66 |
| Gregory & Son, J. J. H. | Marblehead, Mass. | do | 73.67 | 26.33 |
| Grey & Co., Thomas J. | 32 South Market Street, Boston, Mass. | Mail (sample) | 87.33 | 12.67 |
| Do | do | Purchase (bulk) | 89.67 | 10.33 |

TABLE III.—Results of tests of samples of seed obtained in the open market as hairy vetch seed and found to be adulterated or misbranded—Continued.

| Seed offered for sale or sold as hairy vetch by— | | Seed obtained by— | Analysis of samples. | |
|--|--|-------------------|----------------------|------------------|
| Name of dealer. | Address. | | Hairy vetch. | Other vetches. |
| | | | <i>Per cent.</i> | <i>Per cent.</i> |
| Griswold Seed Co. | Lincoln, Nebr. | Mail (sample) | 90.48 | 9.52 |
| Do. | do. | Purchase (bulk) | 89.33 | 10.67 |
| Guelf's Seed Store. | Brockport, N. Y. | Mail (sample) | 68.00 | 32.00 |
| Do. | do. | Purchase (bulk) | 75.00 | 25.00 |
| Gurney Seed & Nursery Co. | Yankton, S. Dak. | do. | 63.34 | 36.66 |
| Hanssen's Sons, Louis. | 213 West Second Street, Davenport, Iowa. | Mail (sample) | 82.33 | 17.67 |
| Do. | do. | Purchase (bulk) | 73.33 | 26.67 |
| Harnden Seed Co. | 505 Walnut Street, Kansas City, Mo. | Mail (sample) | do. | 100.00 |
| Do. | do. | Purchase (bulk) | do. | 100.00 |
| Harris Co., Joseph. | Coldwater, N. Y. | Mail (sample) | 87.33 | 12.67 |
| Do. | do. | Purchase (bulk) | 89.00 | 11.00 |
| Hastings, H. G. | 16 West Mitchell Street, Atlanta, Ga. | do. | 77.34 | 22.66 |
| Harvey Seed Co. | 65 Ellicott Street, Buffalo, N. Y. | do. | 68.00 | 32.00 |
| Heldt Co., The. | 1401 Main Street, Evansville, Ind. | Mail (sample) | 90.67 | 9.33 |
| Do. | do. | Purchase (bulk) | 72.67 | 27.33 |
| Hitchcock & Son, L. H. | 126 Second Avenue, North, Nashville, Tenn. | Mail (sample) | 57.00 | 43.00 |
| Do. | do. | Purchase (bulk) | 57.33 | 42.67 |
| Hoermann, Frank. | 317 Wabash Avenue, Terre Haute, Ind. | do. | 73.67 | 26.33 |
| Holden & Co., R. A. | 46 Main Street, Cincinnati, Ohio. | do. | 80.33 | 19.67 |
| Holway Co., Oscar. | Auburn, Me. | Mail (sample) | 67.34 | 32.66 |
| Do. | do. | Purchase (bulk) | 67.33 | 32.67 |
| Hunkel Co., G. H. | 327 Chestnut Street, Milwaukee, Wis. | do. | 89.00 | 11.00 |
| Iowa Seed Co. | 613 Locust Street, Des Moines, Iowa. | do. | 36.00 | 64.00 |
| Johnson Seed Co. | 217 Market Street, Philadelphia, Pa. | Mail (sample) | 87.00 | 13.00 |
| Do. | do. | Purchase (bulk) | 72.67 | 27.33 |
| Kendel, A. C. | 2010 Ontario Street, Cleveland, Ohio. | do. | 83.34 | 16.66 |
| Koss, Theo. | 488 National Avenue, Milwaukee, Wis. | Mail (sample) | 77.54 | 22.46 |
| Do. | do. | Purchase (bulk) | 79.00 | 21.00 |
| Lee, Arthur G. | Fort Smith, Ark. | do. | 51.33 | 48.67 |
| Leifer Bros. Seed Co. | 104 East Markham Street, Little Rock, Ark. | Mail (sample) | 90.00 | 10.00 |
| Do. | do. | Purchase (bulk) | 87.34 | 12.66 |
| Louisville Seed Co. | 104 South Second Street, Louisville, Ky. | Mail (sample) | 33.46 | 66.54 |
| Do. | do. | Purchase (bulk) | 24.67 | 75.33 |
| McCain Grocery Co. | Fourth and Main Streets, Pine Bluff, Ark. | Mail (sample) | 80.56 | 19.44 |
| Do. | do. | Purchase (bulk) | 84.33 | 15.67 |
| McCullough, J. Charles. | Second and Walnut Streets, Cincinnati, Ohio. | do. | 82.67 | 17.33 |
| McCullough's Sons Co., J. M. | 316 Walnut Street, Cincinnati, Ohio. | Mail (sample) | 34.87 | 65.13 |
| Do. | do. | Purchase (bulk) | 78.33 | 21.67 |
| McLaughlin, Ward & Co. | 140 East Pearl Street, Jackson, Mich. | Mail (sample) | 78.67 | 21.33 |
| Do. | do. | Purchase (bulk) | 71.33 | 28.67 |
| Maule, William Henry. | 1707 Filbert Street, Philadelphia, Pa. | Mail (sample) | 16.00 | 84.00 |
| Do. | do. | Purchase (bulk) | 85.33 | 14.67 |
| Mayo, D. R. | 615 Gay Street, Knoxville, Tenn. | do. | 82.33 | 17.67 |
| Michael's Seed Store. | 316 Pearl Street, Sioux City, Iowa. | do. | 69.00 | 31.00 |
| Muzzy Bros. | 136 Main Street, Paterson, N. J. | Mail (sample) | 82.67 | 17.33 |
| Do. | do. | Purchase (bulk) | 71.67 | 28.33 |
| Nashville Seed Co. | Church and Walnut Streets, Nashville, Tenn. | do. | 43.67 | 56.33 |
| Nebraska Seed Co. | 1208 Jones Street, Omaha, Nebr. | Mail (sample) | 75.00 | 25.00 |
| Do. | do. | Purchase (bulk) | 78.67 | 21.33 |
| Noll & Co., J. F. | Newark, N. J. | do. | 86.67 | 13.33 |
| Northern Seed Co. | Valley City, N. Dak. | Mail (sample) | do. | 100.00 |
| Do. | do. | Purchase (bulk) | do. | 100.00 |
| Ohio Valley Seed Co. | 513 Sycamore Street, Evansville, Ind. | do. | 58.33 | 41.67 |
| Ozark Seed Co. | 209 West Commercial Street, Springfield, Mo. | Mail (sample) | 69.67 | 30.33 |
| Do. | do. | Purchase (bulk) | 59.00 | 41.00 |
| Pease Grain & Seed Co. | 718 South Sixth Street, Beatrice, Nebr. | Mail (sample) | 95.00 | 5.00 |
| Do. | do. | Purchase (bulk) | 70.34 | 29.66 |
| Philipps Seed & Implement Co., Henry. | 115 St. Clair Street, Toledo, Ohio. | do. | 80.33 | 19.67 |
| Philipps & Co., William T. | 519 Monroe Street, Toledo, Ohio. | Mail (sample) | 80.67 | 19.33 |
| Do. | do. | Purchase (bulk) | 76.34 | 23.66 |
| Pittman & Harrison Co. | Sherman, Tex. | Mail (sample) | 50.33 | 49.67 |
| Do. | do. | Purchase (bulk) | 41.33 | 58.67 |

TABLE III.—Results of tests of samples of seed obtained in the open market as hairy vetch seed and found to be adulterated or misbranded—Continued.

| Seed offered for sale or sold as hairy vetch by— | | Seed obtained by— | Analysis of samples. | |
|--|--|----------------------|----------------------|----------------|
| Name of dealer. | Address. | | Hairy vetch. | Other vetches. |
| | | | Per cent. | Per cent. |
| Platt Co., Frank S..... | 350 State Street, New Haven, Conn..... | Purchase (bulk)..... | 76.00 | 24.00 |
| Prunty, Charles E..... | 7 South Main Street, St. Louis, Mo..... | Mail (sample)..... | 22.00 | 78.00 |
| Do..... | do..... | Purchase (bulk)..... | 16.33 | 83.67 |
| Ramsey & Son, D. L..... | 33 Market Street, Auburn, N. Y..... | do..... | 87.00 | 13.00 |
| Rapier Grain & Seed Co..... | Owensboro, Ky..... | Mail (sample)..... | 32.33 | 67.67 |
| Do..... | do..... | Purchase (bulk)..... | 53.67 | 46.33 |
| Reeves Co., Robert C..... | 187 Water Street, New York, N. Y..... | Mail (sample)..... | 78.34 | 21.66 |
| Do..... | do..... | Purchase (bulk)..... | 86.00 | 14.00 |
| Ross Brothers..... | Wichita, Kans..... | Mail (sample)..... | 82.00 | 18.00 |
| Do..... | do..... | Purchase (bulk)..... | 79.67 | 20.33 |
| Rue, Frank E..... | 420 South Adams Street, Peoria, Ill..... | Mail (sample)..... | 83.34 | 16.66 |
| Do..... | do..... | Purchase (bulk)..... | 88.33 | 11.67 |
| St. Louis Seed Co..... | Fourth Street and Lucas Avenue, St. Louis, Mo..... | Mail (sample)..... | 86.67 | 13.33 |
| Do..... | do..... | Purchase (bulk)..... | 82.00 | 18.00 |
| Saul, Charles F..... | 220 James Street, Syracuse, N. Y..... | Mail (sample)..... | 78.00 | 22.00 |
| Do..... | do..... | Purchase (bulk)..... | 86.00 | 14.00 |
| Schisler-Corneli Seed Co..... | 813 North Fourth Street, St. Louis, Mo..... | Mail (sample)..... | 77.67 | 22.33 |
| Do..... | do..... | Purchase (bulk)..... | 87.34 | 12.66 |
| Schwill & Co., Otto..... | 10 South Front Street, Memphis, Tenn..... | Mail (sample)..... | 87.67 | 12.33 |
| Do..... | do..... | Purchase (bulk)..... | 82.67 | 17.33 |
| Scott & Son, O. M..... | Marysville, Ohio..... | Mail (sample)..... | 80.67 | 19.33 |
| Do..... | do..... | Purchase (bulk)..... | 88.67 | 11.33 |
| Shaeffer, W. E..... | 22 Market Street, Lockport, N. Y..... | do..... | 64.67 | 35.33 |
| Shuptrine Co..... | Savannah, Ga..... | Mail (sample)..... | 75.00 | 25.00 |
| Do..... | do..... | Purchase (bulk)..... | 64.67 | 35.33 |
| Siegel, George L..... | 1119 Peach Street, Erie, Pa..... | Mail (sample)..... | 49.52 | 50.48 |
| Do..... | do..... | Purchase (bulk)..... | 35.00 | 65.00 |
| Sioux City Seed & Nursery Co..... | Sioux City, Iowa..... | Mail (sample)..... | 58.33 | 41.67 |
| Do..... | do..... | Purchase (bulk)..... | 62.67 | 37.33 |
| Snow, Harvey B..... | Camden, N. Y..... | Mail (sample)..... | 81.33 | 18.67 |
| Do..... | do..... | Purchase (bulk)..... | 83.33 | 16.67 |
| Southwestern Seed Co..... | 18 West Center Street, Fayetteville, Ark..... | Mail (sample)..... | 78.00 | 22.00 |
| Do..... | do..... | Purchase (bulk)..... | 73.67 | 26.33 |
| Sprecher & Ganss..... | 31 East King Street, Lancaster, Pa..... | Mail (sample)..... | 45.33 | 54.67 |
| Do..... | do..... | Purchase (bulk)..... | 34.00 | 66.00 |
| Springfield Seed Co..... | Campbell and Walnut Streets, Springfield, Mo..... | do..... | 85.67 | 14.33 |
| Steckler Seed Co. (Ltd.), J..... | 512 Gravier Street, New Orleans, La..... | Mail (sample)..... | 76.00 | 24.00 |
| Do..... | do..... | Purchase (bulk)..... | 78.33 | 21.67 |
| Stumpp & Walter Co..... | 50 Barclay Street, New York, N. Y..... | Mail (sample)..... | 91.33 | 8.67 |
| Do..... | do..... | Purchase (bulk)..... | 87.00 | 13.00 |
| Tait & Son, George..... | 78 Commercial Place, Norfolk, Va..... | do..... | 85.00 | 15.00 |
| Theilman Seed Co..... | 1517 State Street, Erie, Pa..... | do..... | 65.67 | 34.33 |
| Tinsley Seed Co..... | 617 N. Fourth Street, St. Louis, Mo..... | Mail (sample)..... | 83.00 | 17.00 |
| Do..... | do..... | Purchase (bulk)..... | 87.67 | 12.33 |
| Van Antwerp's Drug Corporation..... | Dauphin and Royal Streets, Mobile, Ala..... | Mail (sample)..... | 92.00 | 8.00 |
| Do..... | do..... | Purchase (bulk)..... | 88.00 | 12.00 |
| Vaughan's Seed Store..... | 25 Barclay Street, New York, N. Y..... | Mail (sample)..... | 89.33 | 10.67 |
| Do..... | do..... | Purchase (bulk)..... | 86.34 | 13.66 |
| Vick's Sons, James..... | 187 East Main Street, Rochester, N. Y..... | do..... | 34.33 | 65.67 |
| Do..... | do..... | Mail (sample)..... | 30.00 | 70.00 |
| Do..... | do..... | Purchase (bulk)..... | 38.67 | 61.33 |
| Weeber & Don..... | 114 Chambers Street, New York, N. Y..... | Mail (sample)..... | 91.67 | 8.33 |
| Do..... | do..... | Purchase (bulk)..... | 86.67 | 13.33 |
| Willet Seed Co., N. L..... | 849 Broad Street, Augusta, Ga..... | Mail (sample)..... | 36.67 | 63.33 |
| Do..... | do..... | Purchase (bulk)..... | 32.00 | 68.00 |
| Wood, Stubbs & Co..... | 219 East Jefferson Street, Louisville, Ky..... | Mail (sample)..... | 41.67 | 58.33 |
| Do..... | do..... | do..... | 47.33 | 52.67 |
| Do..... | do..... | Purchase (bulk)..... | 37.00 | 63.00 |
| Woodruff & Sons, F. H..... | Milford, Conn..... | Mail (sample)..... | 69.67 | 30.33 |
| Do..... | do..... | Purchase (bulk)..... | 80.00 | 20.00 |
| Wysong, Adolphus..... | Lebanon, Ind..... | Mail (sample)..... | 86.00 | 14.00 |
| Do..... | do..... | Purchase (bulk)..... | 88.00 | 12.00 |
| Yopp Seed Co., M. J..... | 124 South Second Street, Paducah, Ky..... | do..... | 83.00 | 17.00 |

Hairy vetch seed was collected for the first time in 1911 and the proportion of adulterated or misbranded samples was found to be greater than was the case when either orchard grass, Kentucky bluegrass, redtop, alfalfa, or red clover was collected for the first time. Of the vetch seed in the purchased bulks reported in this circular only 55.9 per cent was hairy vetch seed capable of germination. This is a comparatively new crop adapted to use over a large part of the United States and under many conditions it is the best leguminous winter cover crop known. It is unfortunate that the more general use of this plant should be restricted not only by the high price of the seed but by the fact that it is adulterated and of low vitality.

During the eight years since this work was authorized the names of 370 dealers who have sold or offered for sale adulterated or misbranded seeds have been published. Of these 1 has been published five different years, 4 have been published four years, 23 three years, and 84 two years.

As has been formerly stated in its publications, the Department of Agriculture will examine and report promptly as to the presence of adulterants and dodder in any samples of seed submitted for that purpose. According to the location of the sender these may be submitted to the Seed Laboratory at Washington, D. C., or to any of the following laboratories maintained through the cooperation of this Department: Branch Seed-Testing Laboratory, Agricultural Experiment Station, Columbia, Mo.; Branch Seed-Testing Laboratory, Agricultural Experiment Station, Baton Rouge, La.; Branch Seed-Testing Laboratory, Oregon Agricultural College, Corvallis, Oreg.; Branch Seed-Testing Laboratory, Purdue University, La Fayette, Ind.; Branch Seed-Testing Laboratory, California Agricultural Experiment Station, Berkeley, Cal.

B. T. GALLOWAY,
Chief, Bureau of Plant Industry.

Approved:

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., *February 14, 1912.*

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